REMARKS

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to identify Fig. 1 as a circuit diagram showing an electric circuit example to which an embodiment of the present invention is applied.

In addition, the specification has been amended to avoid referring to reference "C1," which has been deleted from Fig. 9.

No new matter has been added, and it is respectfully requested that the amendments to the specification be approved and entered.

THE DRAWINGS

Figs. 1, 9 and 17 have been amended as described hereinabove to correct the informalities pointed out by the Examiner.

Submitted herewith are corrected sheets of formal drawings for Figs. 1 and 9 which incorporate the amendments made thereto and annotated sheets showing the changes made thereto. Also submitted herewith is a proposed amended sheet of drawings for Fig. 17. A replacement sheet for Fig. 17 will be submitted in due course.

No new matter has been added, and it is respectfully requested that the amendments to the drawings be approved and

entered, and that the Examiner's objection to the drawings be withdrawn.

THE CLAIMS

Claims 25-30 have been canceled, and claims 31-36 have been added based on the subject matter of claims 25-30, respectively.

Claims 31-36 have been prepared based to more clearly and positively recite the subject matter of the present invention, in better compliance with the requirements of 35 USC 112.

No new matter has been added, and it is respectfully requested that new claims be approved and entered.

According to the present invention as recited in new independent claim 31 (and corresponding new independent claims 33 and 35), a method is provided for simulating an electric network including a plurality of circuit elements connected by a plurality of wiring lines.

As recited in the new claims, electric functions of the plurality of circuit elements are defined as a plurality of element cells, intersections of the wiring lines at which at least three of the circuit elements are connected as intersection cells, and a plurality of pipes are defined as wiring lines extending between any of: (i) an element cell and another element cell, (ii) an intersection cell and another intersection cell, and (iii) an element cell and an intersection cell. See, for example, Fig. 10, steps S1-S4 in Fig. 11, and the disclosure in

the specification at, for example, page 16, line 13 to page 17, line 21.

Respective rules of transfer of particles through the element cells are set based on respective types of the element cells, and respective rules of transfer of particles through the intersection cells are also set. See, for example, page 18, line 3 to page 23, line and step S3 in Fig. 11.

Transfers of the particles through the element cells and the intersection cells are then performed based on the respective rules. The transfers are repeated until a predetermined convergence condition is satisfied at which a respective number of particles in each of the pipes is substantially steady and a respective number of particles moved through each of the element cells and intersection cells is substantially steady. See, for example, steps S7-S9 in Fig. 11.

That is, according to the simulation method of the claimed present invention, the transfer process is performed until a substantially steady state is reached with respect the number of particles in each pipe and the number of particles moved through each of the element cells and intersection cells, within a predetermined margin. Thus, the convergent state is determined to be reached when the difference in the number of particles in the pipes from one loop to the next and the difference in the number of particles moved through the element cells and the intersection cells from one loop to the next satisfies a

predetermined condition. For example, the predetermined condition could be set such that if the number of particles in the pipes after an nth loop of transfers is less than 1% off from the number of particles in the pipes in the n-1 loop, the predetermined convergence condition is determined to be satisfied.

As recited in new independent claims 31, 33 and 35, once the predetermined convergence condition is satisfied, the number of particles in each of the pipes is determined, and the number of particles moved through each of the element cells and each of the intersection cells is determined.

And as recited in dependent claims 32, 34 and 36, the voltages in the electric network are determined based on the determined number of particles in each of the pipes, and the currents in the electric network based on the determined number the particles moved through each of the element cells and intersection cells.

Thus, according to the simulation method of the claimed present invention, an electric network is defined using interconnected cells, and the voltages and currents in the electric network are determined based on the convergence of "particles" achieved by rules set for each of the interconnected cells.

By contrast, according to "General Purpose Symbolic Simulation Tools for Electric Networks," IEEE Power Industry

Computer Application Conference, May 1987 ("Alvarado et al"), the effect of each element in an electric network is represented by differential equations. And according to Alvarado et al, the voltages and currents in the electric network are determined by solving a plurality of simultaneous differential equations.

The simulation technique of the claimed present invention, however, does not require simultaneous differential equations to be solved. By contrast, according to the claimed present invention, simple equations are repeatedly solved based on the rules for the interconnected cells, until the predetermined convergenge condition is satisfied. The electric network may thus be approximated without solving the simultaneous differential equations of Alvarado et al.

With this structure, according to the claimed present invention, it is possible to simulate a complex network, such as an LSI, which is very difficult using conventional circuit simulation techniques.

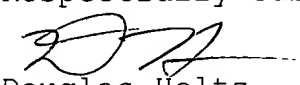
In view of the foregoing, it is respectfully submitted that the present invention as recited in new claims 31-36 clearly patentably distinguishes over Alvarado et al under 35 USC 102 as well as under 35 USC 103.

* *

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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DH:db/iv
encs.

Amendments to the Drawings:

Fig. 1 has been amended to add the label "Prior Art," as required by the Examiner.

Fig. 9 has been amended to delete reference "C1."

Fig. 17 has been amended to replace all occurrences of "DAT" with "DTA," as suggested by the Examiner.

Attachment: Proposed Amended Fig. 17

Annotated Sheets Showing Changes for Figs. 1 and 9

Replacement Sheets for Figs. 1 and 9

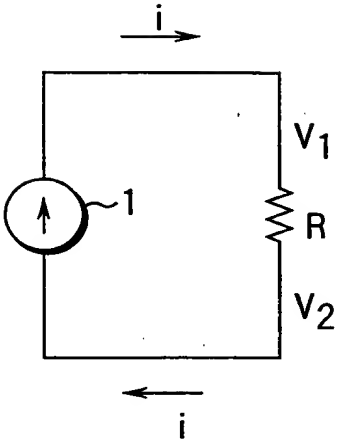

FIG. 1
PRIOR ART

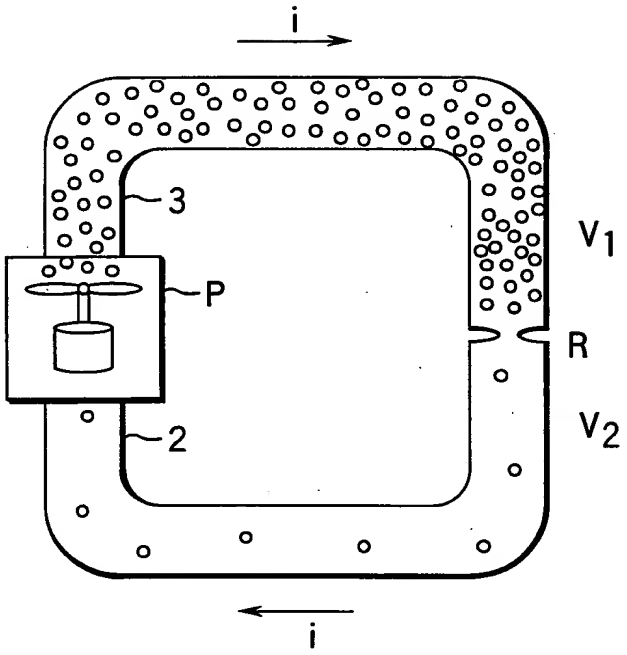

FIG. 2

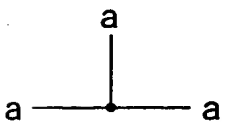

FIG. 3A

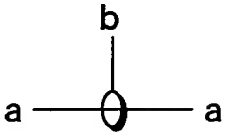

FIG. 3B

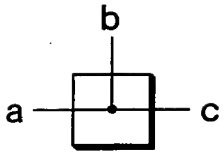

FIG. 3C

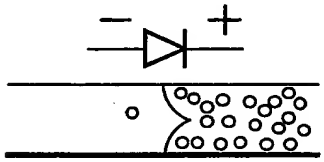

FIG. 4A

FIG. 5A

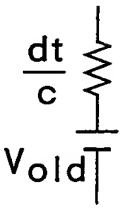

FIG. 5B

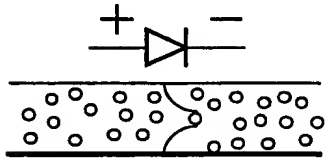

FIG. 4B

FIG. 6A

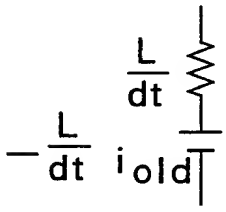

FIG. 6B

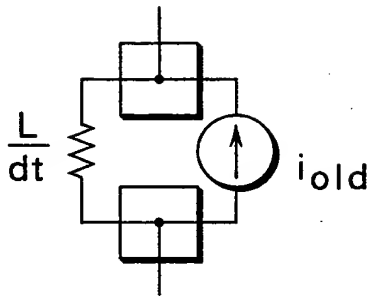

FIG. 6C

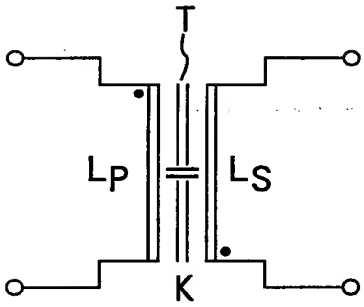

FIG. 7

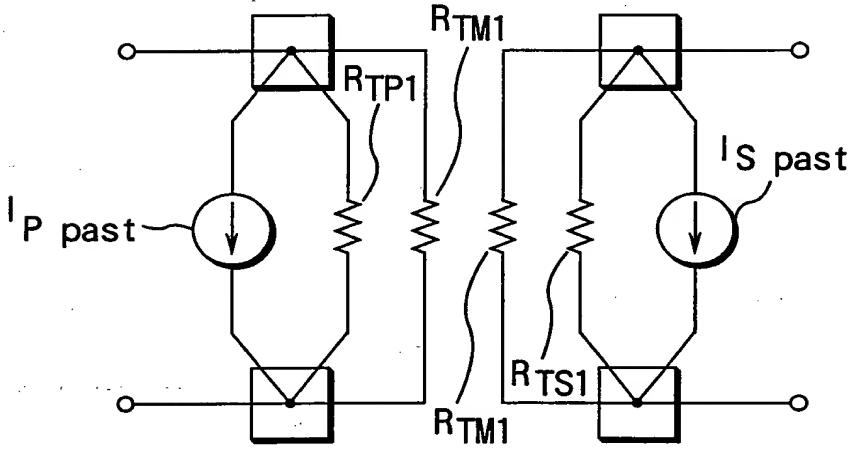

FIG. 8

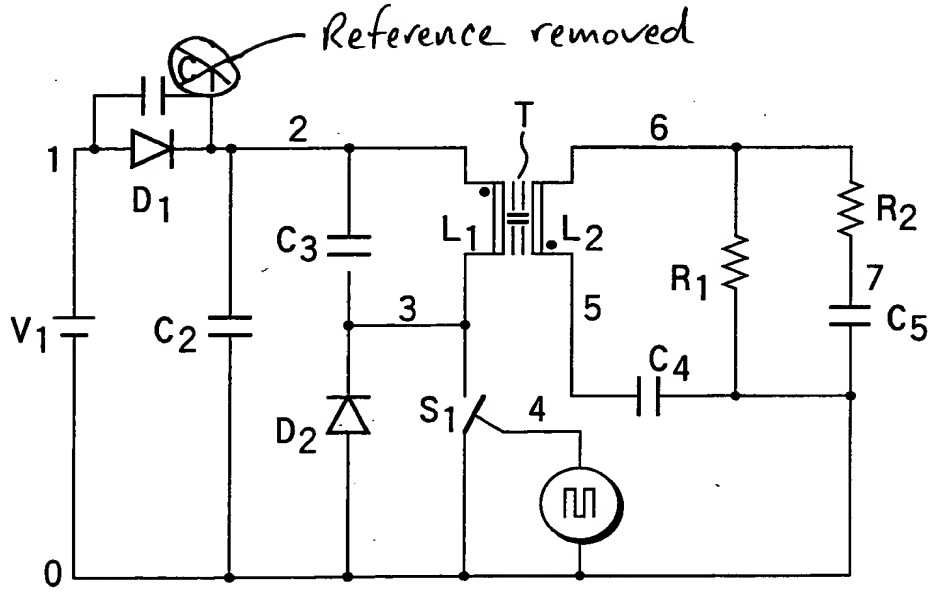

FIG. 9